DOCUMENT RESUME

ED 238 859 SP 023 588

TITLE Techniques for Preventing the Spread of Infectious Diseases.
INSTITUTION California State Dept. of Education, Sacramento.
PUB DATE 83
NOTE 18p.
AVAILABLE FROM Publication Sales, California State Department of Education, P. O. Box 271, Sacramento, CA 95802 ($1.50).
PUB TYPE Guides - Non-Classroom Use (055)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Communicable Diseases; *Disease Control; Food Service; Health Education; *Hygiene; Physical Disabilities; *Physical Health; *Prevention; Public Health; *Sanitation

ABSTRACT

Specific procedures are outlined for prevention of the spread of infectious diseases with techniques of handwashing, diapering, and handling of known disease carriers. Protocols for classroom cleanliness list essential steps and key points and precautions for maintaining a hygienic environment. This section includes a list of protocols for food handling. It is pointed out that the transmission of infectious diseases may occur more readily in special centers for severely handicapped children because of the close personal contact required for care. Appendixes include information on legal requirements, cleaning schedules, selection of disinfectants, and descriptions of contagious diseases. (JD)

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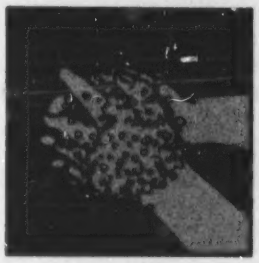
# Techniques for Preventing the Spread of Infectious Diseases



CALIFORNIA STATE
DEPARTMENT OF EDUCATION
Bill Honig—Superintendent of Public Instruction
Sacramento, 1983

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SP023 588

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This publication, *Techniques for Preventing the Spread of Infectious Diseases*, which was developed by the School Health Unit, was edited and prepared for photo-offset production by the staff of the Bureau of Publications, California State Department of Education, 721 Capitol Mall, Sacramento, CA 95814. The document was published by the Department, printed by the Office of State Printing, and distributed under the provisions of the Library Distribution Act and *Government Code* Section 11096.

1983

Copies of this publication are available at $1.50 each, plus sales tax for California residents, from Publications Sales, California State Department of Education, P.O. Box 271, Sacramento, CA 95802.

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# Preface

This addendum to the Department of Education's *Guidelines and Procedures for Meeting Specialized Physical Health Care Needs of Students* was prepared in response to many requests for a compilation of approved procedures designed to prevent the spread of infectious diseases by known or suspected carriers enrolled in a school. The School Health Unit and the Office of Special Education, State Department of Education, worked closely with the Infectious Disease Section, State Department of Health Services, to identify the procedures.

A committee of Orange County school nurses organized the compilation of procedures into this addendum according to the format used in the *Guidelines*. In addition, the Department's School Health Unit's Infectious Disease Ad Hoc Committee, composed of school nurses from the San Juan Unified School District and Sacramento and Napa counties, reviewed the addendum. The procedures contained in the addendum have been approved by the Department of Education.

School districts are advised that all personnel who provide specialized physical health care do so under the direction of the school nurse. For this reason the authority for recommending the level of supervision is assigned to the nurse of the school district.

The Department of Education places a high priority on the need to prevent the spread of infectious diseases in our schools. By encouraging the use of the procedures described in this document, we hope to contribute to the health and regular attendance of students so that they may attain their maximum potential for learning.

We hope that you will find the information in this addendum timely as well as useful in your work setting.

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# Prevention of Infectious Disease with Techniques of Handwashing, Diapering, and Handling of Known Carriers

## I. Personnel

A. School nurse

B. Designated school personnel under indirect supervision

*Designated school personnel* includes all school personnel and volunteers who may have direct contact with the students and contaminated clothing, equipment, supplies, and surfaces of floors, walls, counters, and so forth.

## II. General Information

A. The transmission of infectious diseases may be prevented by utilizing medically related procedures for handwashing, diapering, and classroom cleanliness and by monitoring the actions of suspected and known carriers. Teaching and supervision of staff performing these preventive measures for the control of infectious diseases is an independent school nursing function[1] and does not require a physician's authorization.

1. *Carrier*—a person who is infected with some pathogenic organism which evokes no manifestation of the disease in him or her but which, when transferred to another, may produce the onset of the specific infection. Examples of diseases of particular concern are hepatitis B and cytomegalovirus. (See the appendix for information regarding these diseases.)
2. *Transmission of infectious agent*—any mechanism by which a susceptible human host is exposed to an infectious agent:
   a. *Direct transmission*—immediate transfer which takes place as a result of touching or kissing; or the direct projection of droplet spray onto the conjunctivae or mucous membranes during sneezing, coughing, spitting, singing, or talking (usually not possible over a distance of more than three feet).
   b. *Indirect transmission*—delayed transfer which occurs when the intermediate object carries the virus to a suitable portal of entry (mucous membranes, break in skin, digestive tract). Intermediate objects may be toys, clothing, cooking or eating utensils, water, food and milk, or air contaminated by microorganisms.

B. Transmission of infectious diseases may occur more readily in special centers for severely handicapped children and preschools than in regular classrooms because of the close personal contact required for care.

C. Preventing the spread of infection requires that specific personal and environmental cleanliness techniques similar to those used in licensed health facilities must be practiced *at all times.*

D. Specific personal and environmental cleanliness techniques should be followed in centers for the severely handicapped, whether or not there are known carriers.

E. Prior to the enrollment of a known carrier or the continued attendance of a carrier in the regular or special classroom, the school nurse shall develop procedures appropriate to the student's age and stage of development and for the specific disease.[2] The nurse should carry out the following procedures:

1. Conduct a health and developmental assessment, including a review of the known carrier's medical records. Collaborate with parents and physician to ensure that the carrier's records are complete.
2. Identify, by means of a health history and laboratory tests, those who are more at risk.
3. Designate who may work directly with the carrier; e.g., those who are immune, those who may be immunized, and those who are not likely to become pregnant.

[1]Business and Professions Code Section 2725(a); see Appendix A.

[2]See Appendix C for description of specific diseases.

4. Identify appropriate personal and environmental cleanliness techniques in accordance with student and staff needs.
5. If the regular program cannot be modified and the student is identified as an individual with exceptional needs, write appropriate objectives for the student's Individual Education Program (IEP).
6. Orient and train all staff members, including custodians, substitute teachers, volunteers, and bus drivers, who will be in direct contact with the carrier. Orientation and training must be ongoing and must be given to include new personnel.
7. Arrange for the periodic testing of the carrier to determine carrier status. If periodic testing is *not* done by the primary physician, refer the carrier to the local health department for action and/or written recommendations.
8. Verify the school district's efforts to prevent the spread of infection and to protect the health of employees and students by documenting the training and supervision of employees.

F. Each facility that has a known or suspected carrier in attendance must make provision for personal and environmental cleanliness:

1. Provide ready access to handwashing facilities in each classroom.
2. Provide disposable paper towels. If cloth towels are used, discard them with other contaminated linens after each use.
3. Maintain storage areas for clean clothing, linens, utensils, equipment, and disposable items. These areas must be separate from areas used for storage of soiled items.
4. Keep soiled disposable items in covered waste receptacles lined with disposable plastic bags. At the end of each day, the plastic bags are to be sealed and discarded. DO NOT REUSE.
5. Keep soiled cloth diapers separate from soiled linens in covered waste receptacles lined with disposable plastic bags. Since infection can be spread through damp porous material, cloth laundry bags should not be used.
6. Keep linens belonging to the school separate from those belonging to individual students.
7. Wash diapers separately from the other linens.
8. Provide custodial staff with a cleaning schedule.[1]

[1] See Appendix B.

G. Handwashing is the single most important technique for preventing the spread of disease and should be done frequently. It must be done:

1. Before putting on smock (or large blouse or shirt to cover street clothes) in preparation for working with the students
2. Before drinking, eating, or smoking
3. Before handling clean utensils or equipment
4. Before and after handling student's food
5. Before and after assisting or training the student in toileting and feeding
6. Before and after going to the bathroom
7. After contact with body secretions, such as blood (including menstrual), urine, feces, mucus, saliva, or drainage from wounds
8. After handling soiled diapers, menstrual pads, garments, or equipment
9. After caring for any student, especially those with nose, mouth, or ear discharges
10. After removing disposable gloves
11. After removing smock or shirt when leaving the work area

H. All staff members should practice specific hygienic principles designed to protect themselves and others from infection. They should do the following:

1. Maintain optimum health through effective daily health practices, such as adequate nutrition, rest, exercise, and appropriate medical supervision.
2. Avoid rubbing or touching eyes.
3. Wash hands frequently.
4. Remove jewelry, such as rings and dangling bracelets and earrings, during working hours.
5. Use one's own personal care items, such as combs, fingernail files, nail clippers, lipsticks, and toothbrushes.
6. Keep fingernails clean and trimmed short.
7. Refrain from kissing students.

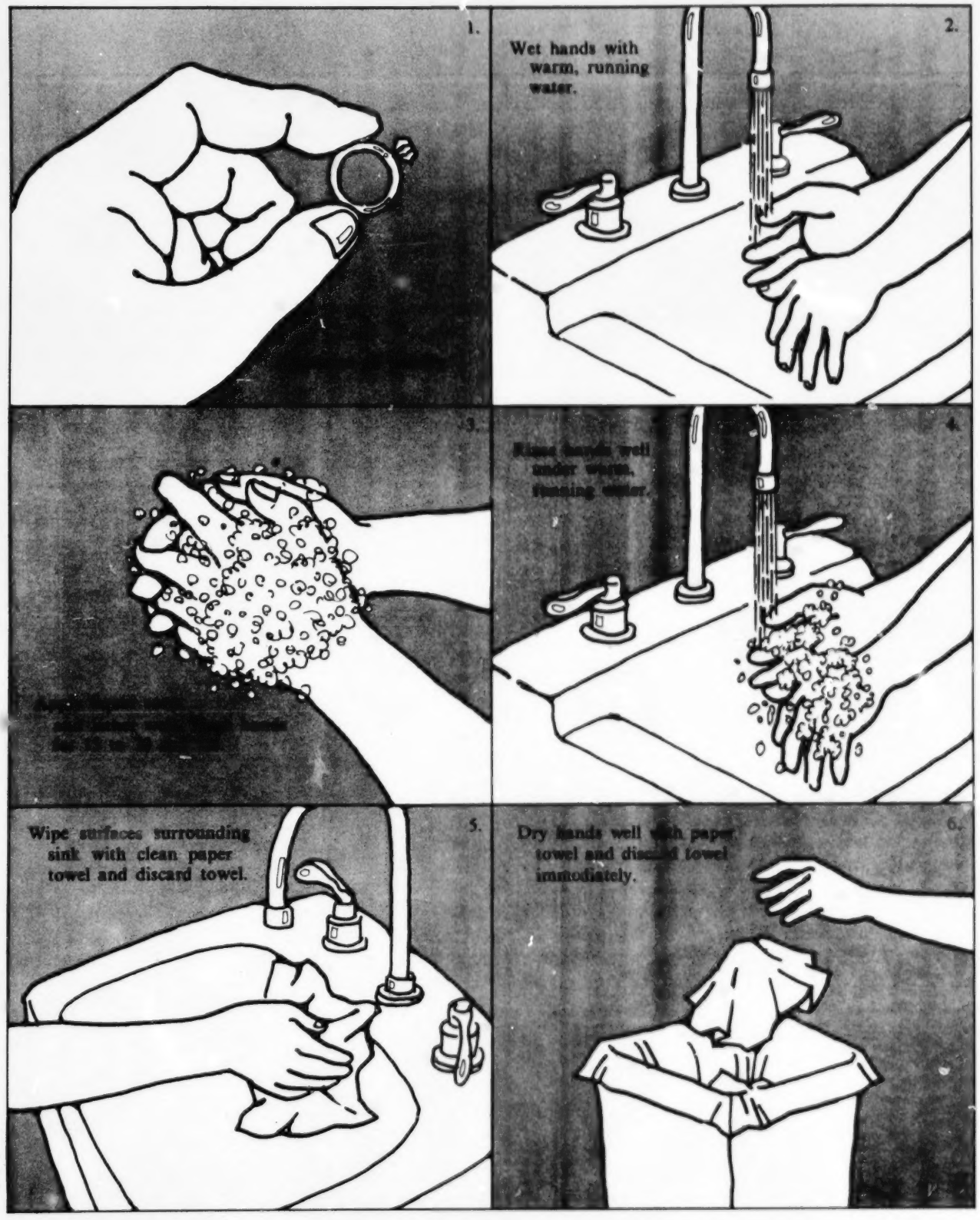
## III. Guidelines for Handwashing

A. Purpose

To reduce the number of microorganisms on the hands

B. Equipment

1. Liquid soap in dispenser (preferred to bar soap)
2. Paper towels
3. Hand lotion
4. Covered waste receptacle with disposable plastic liner


1.
2.
Wet hands with warm, running water.
3.
4.
5.
Wipe surfaces surrounding sink with clean paper towel and discard towel.
6.
Dry hands well with paper towel and discard towel immediately.

C. Protocol for handwashing

| Essential steps | Key points and precautions |
|---|---|
| 1. Remove all jewelry. | Jewelry should not be worn when working with students who require repeated physical contact and care. Microorganisms can become lodged in settings or stones of rings. |
| 2. Wet hands with warm, running water. | Warm water, combined with soap, makes better suds than does cold water. Hot water removes protective oils and will dry skin. Running water is necessary to carry way dirt and debris. |
| 3. Apply liquid soap and lather well. | Liquid soap is preferred to bar soap. Bacteria grow on bar soap and in soap dishes. |
| 4. Wash hands, using a circular motion and friction, for 15 to 30 seconds. | Include front and back surfaces of hands, between fingers and knuckles, around nails, and the entire wrist area. Avoid harsh scrubbing to prevent skin breaks. |
| 5. Rinse hands well under warm, running water. | Hold hands under the water so that water drains from wrist area to fingertip. |
| 6. Repeat steps 3 through 5. | All remaining bacteria and soil should now be removed. |
| 7. Wipe surfaces surrounding sink with clean paper towel and discard the towel. | Damp surfaces promote the growth of bacteria. |
| 8. Dry hands well with paper towels and discard towels immediately. | Because of frequent handwashing, it is important to dry gently and thoroughly to avoid chapping. Chapped skin breaks open, thus permitting bacteria to enter one's system. |
| 9. Apply lotion as desired. | Lotion helps keep skin soft and reduces chapping. |

## IV. Guidelines for Diapering

A. Purpose

To avoid cross-contamination when diapering

B. Equipment

1. Changing table
2. Supplies (soap, water, cotton balls or soft tissue) for cleaning the student's skin
3. Plastic bags for student's soiled clothing
4. Covered waste receptacle lined with disposable plastic bags for disposable diapers
5. Covered receptacle lined with disposable plastic bags for soiled cloth diapers
6. Plastic bag ties or masking tape for sealing disposable plastic bags at time of discard
7. Disposable plastic gloves (medium or large size, nonsterile)
8. Disinfectant for cleaning changing table (See Appendix B.)

C. Protocol for diapering

| Essential steps | Key points and precautions |
|---|---|
| 1. Place student on clean changing table. | Do not leave student unattended. |
| 2. Remove soiled diaper and place in appropriate receptacle. | If diaper is cloth and soiled with feces, leave it on the changing table until the student is returned to the classroom. |
| 3. If other clothing is soiled, remove it and place it directly in identifiable plastic bag that can be secured and sent home at the end of the day. | |
| 4. Cleanse the perineum and buttocks thoroughly with soap and water. | Ointments and powders are used only when authorized and provided by parent. |

C. Protocol for diapering—continued

| Essential steps | Key points and precautions |
|---|---|
| 5. Rinse and dry skin prior to applying clean diaper. | |
| 6. Return student to classroom. | |
| 7. Wear disposable plastic gloves to rinse and wring out in toilet any cloth diaper soiled with feces. | |
| 8. After rinsing, place the cloth diaper in the appropriate receptacle. | |
| 9. Remove gloves and discard them in the appropriate receptacle. | Wash hands after wearing gloves. |
| 10. Report abnormal conditions to the appropriate person | Abnormal conditions may be:<br>1. Blood or streaks of blood on diaper<br>2. Watery, liquid stool<br>3. Mucus or pus in stool<br>4. Clay-colored stool<br>5. Skin rashes, bruises, or breaks in skin |
| 11. Use disinfectant to clean changing table. (See Appendix B.) | |

## V. Guidelines for Classroom Cleanliness

A. Purpose

To prevent the transmission of infectious disease

B. Equipment

1. Smock (large blouse or shirt to cover street clothes)
2. Covered waste receptacles with disposable plastic bags
3. Plastic bags that can be labeled and sealed for individual's soiled laundry
4. Disposable plastic gloves (medium or large size, nonsterile)
5. Disinfectant
6. Liquid soap and dispenser
7. Washer and dryer (if disposable linens are not available)
8. Dishwasher (if disposable eating utensils are not available)

C. Protocol for classroom cleanliness

| Essential steps | Key points and precautions |
|---|---|
| 1. Wash hands. | See "Guidelines for Handwashing." |
| 2. Wear a smock.<br>a. Use a clean smock each day. | Smocks should be laundered in the facility's washer and dryer, if available, so that possibly contaminated clothing is not brought into the home environment. |
| b. Always hang the smock right side out when leaving the work area for breaks or lunch. | This ensures that the side of the smock worn next to your clothing will remain clean. |
| 3. If there are open cuts, abrasions, or weeping lesions on hands, wear disposable plastic gloves.<br>a. Use a new pair of gloves in each situation in which handwashing is indicated.<br>b. Discard used gloves in plastic bag in covered waste receptacle. | Open skin areas provide entry points for infection.<br>For a list of situations in which handwashing is indicated, see page 2. |
| 4. Store and handle clean clothing and linens separately from soiled clothing and linens.<br>a. Immediately place each student's soiled clothing linens in an individually labeled plastic bag, which is to be sealed and sent home at the end of each day. | When clothing and linens have been moved from the clean storage area, they are considered to be soiled.<br>Because students may be undiagnosed carriers of infectious disease, all soiled articles should be treated as if they were contaminated. |

C. Protocol for classroom cleanliness—continued

| Essential steps | Key points and precautions |
|---|---|
| b. Immediately place all soiled school linens in a plastic bag in a covered waste receptacle. Launder linens daily. | |
| 5. Use specific techniques for handling food and utensils during preparation, serving, storage, and cleanup: | |
| a. Maintain a clean area of the kitchen for serving food. | Food, clean dishes, and utensils should be stored in a "clean" storage area. |
| b. Maintain a separate area of the kitchen for cleanup. | Because students may be undiagnosed carriers of infectious disease, all leftover food, dishes, and utensils should be treated as if they were contaminated. |
| c. Scrape food from soiled dishes and/or place disposable dishes in plastic-lined, covered waste receptacle. | |
| d. Pour liquids into sink drain. | |
| e. Rinse dishes and utensils with warm water before placing them in the dishwasher. | Prerinsing of dishes removes food particles which might remain if the dishes were placed directly in the dishwasher. |
| f. Clean sinks, counter-tops, tables, chairs, trays, and any other areas where foods or liquids have been discarded or spilled; use approved disinfectant. (See Appendix B.) | |
| g. Wash hands prior to removing clean dishes from the dishwasher and storing them in a "clean" area of the kitchen. | |
| 6. Use specific housekeeping techniques for storing, cleaning, and disposing of classroom equipment, supplies, and other items. | |
| a. Immediately after use, discard any soiled *disposable* items by placing them in a plastic bag in a covered waste receptacle. | |
| b. Store each student's personal grooming items (combs, brushes, toothbrushes) separately. | For toothbrushes to be thoroughly air-dried after each use, they must be stored in separate holders that allow *direct* air contact. |
| c. In handling disposable diapers, at least once a day, seal and discard the disposable plastic bag used to line the covered receptacle. | |
| d. Store and wash cloth diapers separately from other linens. At least once a day, seal and discard the soiled plastic bag used to line the covered waste receptacle. | |
| 7. Use an appropriate disinfectant for all cleaning procedures. (See Appendix B.) | |
| a. Clean protective floor pads, bolsters, wedges, and so forth after each nonambulatory student has been removed and at the end of each day. | |
| b. Clean all equipment and toys at the end of each day. | Toys and equipment that cannot be readily disinfected should not be used or should be provided for the exclusive use of individual students. |
| c. If a rug or carpet becomes soiled, **clean it immediately.** | Leave disinfectant on soiled area for the prescribed time before rinsing with clear water. Because wet disinfectant may cause a contact dermatitis, staff and students should avoid the area until it is rinsed and dry. |
| d. Clean changing tables, bathtubs, sinks, portable potties, and toilet seats after each use. **Rinse with clear water and wipe dry.** | Rinsing and drying are essential to prevent contact with wet disinfectant, which may cause dermatitis. |

## APPENDIX A

# Legal References

### Business and Professions Code Section 2725, Nurse Practice Act

The practice of nursing within the meaning of this chapter means those functions helping people cope with difficulties in daily living which are associated with their actual or potential health or illness problems or the treatment thereof which require a substantial amount of scientific knowledge or technical skill, and includes all of the following:

(a) Direct and indirect patient care services that insure the safety, comfort, personal hygiene, and protection of patients; and the performance of disease prevention and restorative measures.

(b) Direct and indirect patient care services, including, but not limited to, the administration of medications and therapeutic agents necessary to implement a treatment, disease prevention, or rehabilitative regimen prescribed by a physician, dentist, or podiatrist.

. . . . . .

(d) Observation of signs and symptoms of illness, reactions to treatment, general behavior, or general physical condition, and (1) determination of whether such signs, symptoms, reactions, behavior, or general appearance exhibit abnormal characteristics; and (2) implementation, based on observed abnormalities, of appropriate reporting, or referral, or standardized procedures, or changes in treatment regimen in accordance with standardized procedures, or the initiation of emergency procedures. "Standardized procedures," as used in this section, means either of the following:

. . . . . .

(2) Policies and protocols developed through collaboration among administrators and health professionals, including physicians and nurses, by an organized health care system which is not a health facility licensed pursuant to Chapter 2 (commencing with Section 1250) of Division 2 of the Health and Safety Code. Such policies and protocols shall be subject to any guidelines for standardized procedures which the Board of Medical Examiners and the Board of Nursing Education and Nurse Registration may jointly promulgate....

### California Education Code Section 49426— Definition of School Nurse

School nurses strengthen and facilitate the educational process by improving and protecting the health status of children and by identification and assistance in the removal or modification of health-related barriers to learning in individual children. The major focus of school health services is the prevention of illness and disability, and the early detection and correction of health problems. The school nurse is especially prepared and uniquely qualified in preventive health, health assessment, and referral procedures.

Nothing in this section shall be construed to limit the scope of professional practice or otherwise to change the legal scope of practice for any registered nurse or other licensed healing arts practitioner. Rather, it is the intent of the Legislature to provide positively for the health services, many of which may be performed in the public schools only by physicians and school nurses.

### California Administrative Code, Title 16, Consumer Affairs

**1471—Definitions.** For purposes of this article:

(a) "Standardized procedure functions" means those functions specified in Business and Professions Code Section 2725(c) and (d) which are to be performed according to "Standardized procedures."

(b) "Organized health care system" means a health facility which is not licensed pursuant to Chapter 2 (commencing with Section 1250), Division 2 of the Health and Safety Code and includes, but is not limited to, clinics, home health agencies, physicians' offices and public or community health services.

(c) "Standardized procedures" means policies and protocols formulated by organized health care systems for the performance of standardized procedure functions.

**1474—Standardized Procedure Guidelines**

(a) Standardized procedures shall include a written description of the method used in developing and approving them and any revision thereof.

(b) Each standardized procedure shall:

(1) Be in writing, dated and signed by the organized health care system personnel authorized to approve it.

(2) Specify which standardized procedure functions registered nurses may perform and under what circumstances.

(3) State any specific requirements which are to be followed by registered nurses in performing particular standardized procedure functions.

(4) Specify any experience, training, and/or education requirements of performance of standardized procedure functions.

(5) Establish a method for initial and continuing evaluation of the competence of those registered nurses authorized to perform standardized procedure functions.

(6) Provide for a method of maintaining a written record of those persons authorized to perform standardized procedure functions.

(7) Specify the scope of supervision required for performance of standardized procedure functions, for example, immediate supervision by a physician.

(8) Set forth any specialized circumstances under which the registered nurse is to immediately communicate with a patient's physician concerning the patient's condition.

(9) State the limitations on settings, if any, in which standardized procedure functions may be performed.

(10) Specify patient recordkeeping requirements.

(11) Provide for a method of periodic review of the standardized procedures.

## APPENDIX B

# Cleaning Schedule and Selection of Disinfectants

### Special Instructions

If gloves are worn when a disinfectant is being used, they must be washed and air-dried after each use. They must be stored in the room of use in the area reserved for soiled articles.

Disinfectants must be selected and used in accordance with the information in this appendix. Sprays are not recommended.

If bleach solution is used, it must be mixed daily; and doors must be open for air circulation.

- Clean the following areas and items daily:

  Classrooms, bathrooms, and kitchen
  - Floors
  - Sinks and faucet handles
  - Cabinet drawer handles
  - Doorknobs

- Clean the following bathroom areas and fixtures daily:
  - Walls behind sinks
  - Toilets
  - Portable potty (After disinfecting, rinse with clear water and wipe dry.)

- Vacuum carpets daily. (If a rug or carpet is soiled, it should be disinfected immediately.)

- Clean waste receptacles monthly.

- Steam-clean carpets quarterly.

### Selecting Disinfectants[1]

No single agent should be used for both handwashing and environmental disinfection, because no single agent has been manufactured for the intended use of both environmental disinfection and germicidal handwashing. Many different chemical disinfectants and germicidal handwashing solutions are available commercially, and the selection of a single product is not an easy task for anyone. Such factors as cost, availability of vendors geographically, and the ease of use must be considered. Any chemical disinfectant, detergent, or germicidal handwashing product that is suitable and safe for hospital use and is registered by the Environmental Protection Agency would be suitable for use in a school setting.

A. Selection of an environmental disinfectant
   1. Select an agent that is registered by the U.S. Environmental Protection Agency (EPA) for use as a disinfectant in medical facilities and hospitals.
   2. Select an agent that belongs to one of the following classes of disinfectants:
      a. Ethyl or isopropyl alcohol (70—90 percent)
      b. Quaternary ammonium germicidal detergent solution (2 percent aqueous solution)
      c. Iodophor germicidal detergent (500 ppm available iodine)
      d. Phenolic germicidal detergent solution (1 percent aqueous solution)
      e. Sodium hypochlorite (100 ppm available chlorine)
   3. If the products are used in accordance with the manufacturer's instructions, they are safe to use.

B. Selection of germicidal handwash[2]
   1. Select a germicidal handwashing agent that is registered by the EPA for use as a germicidal handwashing agent.
   2. Select a product that has one of the following active antimicrobial agents in it:
      a. Chlorhexidine
      b. Hexachlorophene
      c. Iodophors
      d. Alcohols
   3. If these products are used in accordance with the manufacturer's instructions, they are safe to use.

[1]Advice provided by Gregg Pullen, Infection Control Officer, Valley Children's Hospital, Fresno, California.

[2]If the staff is conscientious about using the suggested handwashing techniques (pages 2—4), germicidal solution is not necessary.

## APPENDIX C

# Descriptions of Contagious Diseases

### Cytomegalovirus

The cytomegalovirus (CMV), a member of the herpes virus group, was first isolated in 1956, and studies since then have shown that infection with this virus, or group of viruses, is common in human populations throughout the world. Infection rates, which appear to be related to levels of community and personal hygiene, vary from almost 100 percent of the adult population in developing countries to between *20 to 40 percent in highly developed areas.*

#### Congenital Infection

Infection with CMV assumes particular significance in pregnant women because, like rubella, the virus can infect the fetus *in utero* and cause subsequent damage. The risk of serious fetal injury is mainly associated with a mother's first (or primary) infection during pregnancy.

Infants born to mothers shedding CMV in cervical secretions are often infected near term or during or after delivery.

Studies in the United States indicate that at any given time, about 10 to 15 percent of all infants and children up to the age of four years may be excreting CMV in their saliva and urine.

#### Risk of CMV Infection

The risk of CMV infection for female employees working in medical and educational facilities where infants with congenital CMV receive care is probably of little significance when compared to the exposure to the much larger number of unrecognized CMV shedders. *For every infant born with symptoms of CMV, at least ten have asymptomatic congenital infections, and total congenital infections (about 1 to 2 percent of all births)* are outweighed by the large number of CMV infections acquired neonatally (i.e., about 10—15 percent of all infants). Whether women who provide care to any group of infants and children have any greater risk of acquiring *primary infection* with CMV than women not so employed is not known.

The most important routes of CMV transmission are apparently contact with urine or saliva of CMV shedders through kissing, child's drools, or poor personal hygiene after handling diaper changes, and so forth. Thus, nursery and other child care staff who adhere to proper precautions for the handling of the secretions and excretions from these infants are employing sufficient procedures to prevent virus transmission to those providing child care. Handwashing after each child or diaper contact is of paramount importance.

#### Recommendations for Women of Childbearing Age

Women who may become pregnant should be informed that this virus is ubiquitous and that prevention of infection from infants and children in any setting (home or occupation) is best accomplished by observance of *good personal hygiene and good patient care, since saliva and urine are presumably major sources of infection.* They should be advised that *this virus is of relatively low infectivity, and very close physical contact is necessary to transmit CMV virus.*

### Hepatitis B Infection

Viral hepatitis, type B (HBV), is of major public health importance in the United States. The number of cases reported has been increasing steadily since 1966.

Hepatitis B was thought to be transmitted only through percutaneous routes, such as inoculation with blood-contaminated needles, or transfusion of blood, or blood products from HBV carrier donors. Recent evidence indicates that HBV is also spread by close personal contact when blood, or other body secretions contaminated by blood containing HBV, breach the skin or mucous membranes. Babies born of HBsAG positive mothers or having household contact with carriers are subject to increased risk. Hepatitis B is not transmitted by the fecal-oral route.

#### Control and Prevention

Recommendations for limiting the spread of hepatitis B have emphasized minimizing exposure to sources of infection. Emphasis is placed on improving personal and environmental hygiene, disease surveillance, public education, and the safety of blood transfusion. These measures have been partially successful.

Good personal hygiene is the keystone of protection against hepatitis B infection. The single most important practice is *careful handwashing.* This, combined with the common sense avoidance of likely sources of infection, is fundamental in hepatitis B control.

Even though a hepatitis B vaccine is now available, we must continue to rely on general measures to reduce the chances of exposure and to follow sound practices for containing infection when the risk of hepatitis B is great.

In general the risk of hepatitis B transmission in classrooms containing individuals with exceptional needs who are carriers appears to be very low, provided common sense hygiene measures are practiced; e.g., good handwashing and avoidance of exposure to blood.[1] Of course the behavioral characteristics (aggressiveness and bleeding tendency) of the pupils are important factors governing transmission risks.

[1]Including menstrual blood and menstrual pads.

**Prevention by Immunization**

The United States Public Health Services (USPHS) published guidelines on the use of the new hepatitis B vaccine in the June 25, 1982, issue of the *Morbidity Mortality Weekly Report* (issued by the Centers for Disease Control). According to these guidelines, hepatitis B vaccine may be offered to susceptible students and staff in classrooms with carriers who exhibit aggressive behavior or have special medical problems that increase the risk of exposure to blood or serious secretions. Contact your local public health department for further information concerning this vaccine.

**Procedures Requiring Special Attention**

The hepatitis B surface antigen carrier *must not participate* in the following at school:

1. Toothbrushing or flossing of the teeth
2. Clipping of fingernails or toenails
3. Using sharp, cutting instruments or vocational equipment
4. Having temperature (oral or rectal) taken, unless using plastic disposable thermometer covers to avoid hand contamination while reading
5. Sharing of toys that may be put into the mouth
6. Sharing of food, liquids, and utensils
7. Biting, kissing, or putting fingers in each other's mouths
8. Sharing equipment or personal items

Handwashing by care-givers of children with active herpes simplex lesions remains the cornerstone of control. This is regardless of the location of the lesion or the virus type. Handwashing should occur after handling a child with active lesions. Hands should be washed before and after the care-givers use the toilet. Care-givers should not kiss children with active lesions. Close physical contact between children with and children without active lesions should be restricted. Towels, clothing, and eating utensils used by a child with active lesions should be kept separate from those used by other children. Toys that are mouthed and covered with saliva by any child should always be washed before being given to another child. Similarly, care-givers with active cold sores should not kiss any child and should keep their hands out of their mouths; at some medical centers, they have been restricted from working in nurseries for newborn babies. Care-givers with active hand lesions have been more universally restricted from direct patient care. Care-givers with active genital lesions are felt to pose no risk to others as long as they remain clothed and wash their hands.

When active, weeping herpetic lesions are localized and can be covered and close contact with other children can be restricted, exclusion from school or other programs seems unwarranted. Once lesions have crusted and are dry, communicability is low, though asymptomatic shedding may continue or recur. Again, 80 to 90 percent of primary herpes infections are asymptomatic; 50 percent of the population has recurrent oral herpes lesions; and 2 to 10 percent of the population is asymptomatically shedding herpes simplex virus at any one time. The greatest majority of herpes simplex infections are transmitted during a period of asymptomatic virus shedding.

**Herpes Simplex**

Herpes simplex is a viral infection marked by latency and repeated recurrent localized lesions. Caused by two viral subtypes, herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2), the majority (80 to 90 percent) of primary infections with either type produce no symptoms. Primary infection with HSV-1 usually occurs in early childhood before age five years. Primary infection with HSV-2 usually occurs after sexual maturity with peak rates of infection seen in sexually active young adults.

From 50 to 90 percent of adults possess antibodies in their blood to herpes simplex, indicating previous primary infection with either one or both types of the virus.

Herpes simplex virus types 1 and 2 can be separated by their characteristics in laboratory conditions. Clinically, this separation is less distinct: 25 percent of genital herpes and disseminated neonatal herpes is caused by type 1; 10 percent of oral herpes and herpes meningoencephalitis is caused by type 2. The methods of control are identical for either type of virus.

In 10 to 20 percent of primary infections, overt disease may occur as a mild or severe illness marked by fever and malaise, lasting a week or more and associated with vesicular lesions on mucous membranes (lip, mouth, throat, eye, external genitalia, or vagina). Primary lesions generally erupt following a four-to-five-day incubation period (range 2 to 12 days). Viral shedding is most active in the first 24 hours after eruption, and communcability is estimated to last up to two weeks. Intermittent asymptomatic shedding may occur years after the primary infection and is believed to be the most common means of spread of herpes simplex infections. It is estimated that 2 to 10 percent of the population is asymptomatically shedding herpes simplex virus at any one time.

Reactivation or recurrence of the latent infection (the virus was dormant in the closest nerve ganglion cells) commonly results in fever blisters, cold sores, or genital lesions. This reactivation is often precipitated by exposure to sunlight, trauma, physiologic changes, stress, or intercurrent illness. The recurrence is in the same general localized area as the primary infection was. It is typically much milder, crusting and healing within a few days. Viral shedding is much less concentrated, and communicability is estimated at five to seven days. Approximately half of the population suffers from recurrent oral herpes simplex lesions.

Transmission of herpes simplex virus is by direct contact with the virus, generally by oral-oral, oral-genital, or genital-genital contact. The virus is not highly communicable: Only 50 percent of infants born through infected birth canals contract neonatal herpes simplex virus infections. Unbroken skin is generally an effective barrier to virus transmission, though it can become infected with direct inoculation (usually on the fingers), among wrestlers, and on eczematoid or broken skin. Immuno-compromised individuals are more susceptible to both frequent recurrence and severe disseminated disease. The virus generally requires a moist, warm environment for survival. Transmission by food, cups, clothing, toilet seats, or other objects is unlikely and has of yet not been documented.

### Congenital Rubella Syndrome

Congenital rubella syndrome occurs among 20 to 25 percent or more of infants born to women who have acquired rubella during the first trimester of pregnancy, with decreasing frequency thereafter. This syndrome includes cataracts, microphthalmia, microcephaly, mental retardation, deafness, patent ductus arteriosus with other cardiac defects, thrombocytopenic purpura, hepatosplenomegaly with jaundice, and radiographically distinctive bone defects. Moderate and severe cases of congenital rubella syndrome are immediately recognizable at birth; mild cases having only slight cardiac involvement or partial deafness may not be detected for months or years after birth. These congenital malformations and even fetal death may occur following both clinically manifest and inapparent rubella infection in the pregnant woman in the first trimester.

*Congenital Rubella (CR)*—Rubella virus has been detected from pharyngeal secretions and urine in over 80 percent of CR infants during the first month of life; in about 60 percent at age one through four months; 33 percent at five through eight months; and about 10 percent at nine through twelve months. By eighteen months of age, virtually no pharyngeal or urinary excretion of virus can be documented. There are a few reports of transmission of rubella virus infections from CR infants to susceptible hospital and nursery personnel. We thus have to conclude that the potential of transmission of rubella virus from a CR infant is present albeit at a declining rate from birth to about eighteen months.

Precautions which should be observed in the management of these infants in a community setting include the following:

1. Professional staff members, especially females, in contact with CR infants should have a rubella antibody test to determine their susceptibility to rubella.
2. Those who lack antibodies to rubella should be offered rubella vaccine, with care taken to avoid giving vaccine during or within three months of pregnancy.
3. Volunteers of childbearing ages and mothers of other (non-CR) infants who may also be in direct contact with these infants (up to eighteen months of age) should be informed of the potential risk and should also be screened for rubella antibodies. Vaccine should be given to those without antibodies.

## Other Publications Available from the Department of Education

*Techniques for Preventing the Spread of Infectious Diseases* is one of approximately 500 publications that are available from the California State Department of Education. Some of the more recent publications or those most widely used are the following:

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| Better Schools, Better People: How Schools Can Prevent Drug, Alcohol Abuse (1979) | $1.50 |
| California Private School Directory | 9.00 |
| California Public School Directory | 12.50 |
| Criteria for Assessing Alcohol Education Programs (1976) | 1.00 |
| Criteria for Evaluating the School Health Education Program (1977) | 1.00 |
| Criteria for Evaluating the School Health Services Program (1982) | 1.50 |
| Eating Habits of Students in California Public Schools, A Summary (1981) | 2.50 |
| Guidelines and Procedures for Meeting the Specialized Health Care Needs of Students (1980)* | 2.50 |
| Guidelines for School-Based Alcohol and Drug Abuse Programs (1981) | 1.00 |
| Handbook for Planning an Effective Mathematics Program (1982) | 2.00 |
| Handbook for Planning an Effective Reading Program (1983) | 1.50 |
| Handbook for Planning an Effective Writing Program (1983) | 2.50 |
| Health Instruction Framework for California Public Schools (1978) | 1.35 |
| History—Social Science Framework for California Public Schools (1981) | 2.25 |
| Improving the Human Environment of Schools (1979) | 2.50 |
| Nutrition Education—Choose Well, Be Well: A Resource Manual for Preschool, Kindergarten, and Elementary Teachers (1982) | 2.25 |
| Nutrition Education—Choose Well, Be Well: A Resource Manual for Secondary Teachers (1982) | 2.25 |
| Nutrition Education—Choose Well, Be Well: A Curriculum Guide for Preschool and Kindergarten (1982) | 3.75 |
| Nutrition Education—Choose Well, Be Well: A Curriculum Guide for the Primary Grades (1982) | 3.75 |
| Nutrition Education—Choose Well, Be Well: A Curriculum Guide for the Upper Elementary Grades (1982) | 3.75 |
| Nutrition Education Today: Curriculum Design for Nutritional Knowledge and Food Use, Secondary and Adult Education (1981) | 2.50 |
| Planning a Publicity Campaign (Nutrition Education Training Program packet) (1981) | 2.00 |
| Raising Expectations: Model Graduation Requirements (1983) | 2.75 |
| Reading Framework for California Public Schools (1980) | 1.75 |
| Relationship Between Nutrition and Student Achievement, Behavior, and Health (1980) | 4.00 |
| Science Framework for California Public Schools (1978) | 1.65 |
| Student Achievement in California Schools | 2.00 |
| Taking Risks: Activities and Materials for Teaching About Alcohol, Other Drugs, and Traffic Safety, Book I, Elementary (1979) | 2.00 |
| Taking Risks: Activities and Materials for Teaching About Alcohol, Other Drugs, and Traffic Safety, Book II, Secondary (1979) | 2.00 |
| Teaching About Sexually Transmitted Diseases (1980) | 1.65 |
| Techniques for Preventing the Spread of Infectious Diseases (1983) | 1.50 |
| VD Education in California (1976) | 1.00 |
| Visual and Performing Arts Framework for California Public Schools (1982) | 3.25 |

Orders should be directed to:

California State Department of Education
P.O. Box 271
Sacramento, CA 95802

Remittance or purchase order must accompany order. Purchase orders without checks are accepted only from government agencies in California. Sales tax should be added to all orders from California purchasers.

A complete list of publications available from the Department may be obtained by writing to the address listed above.

*Includes 1982 and 1983 revisions.



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